

What is Claimed Is:

1. A circuit for use on a mobile platform including a flight control system, a structure, an aerodynamic surface, and an actuator operatively coupled to the surface to control the surface, the circuit comprising:
 - a first input for accepting a command from the flight control system;
 - a second input for accepting a signal representative of a vibration of the structure;
 - a summing element in communication with the inputs to sum the signal and the command; and
 - a first output in communication with the actuator to control the actuator with the summed signal and command, the circuit adapted to be coupled to the actuator.
2. The circuit according to Claim 1, further comprising a vibration sensor in communication with the second input to generate the signal, wherein the vibration is of the actuator.
3. The circuit according to Claim 1, further comprising a third input for accepting a signal representative of a position of the actuator, a filter in communication with the second and third inputs and to filter the vibration signal from the position signal, and a second output for outputting the filtered position signal.
4. The circuit according to Claim 1, wherein the circuit is a microprocessor.

5. The circuit according to Claim 1, wherein the circuit is analog.
6. The circuit according to Claim 1, further comprising an inverter interposed between the first input and the summing element to invert the vibration signal, wherein the summing element sums the inverted vibration signal and the command.
7. A controller for use on a mobile platform including a flight control system, a structure, an aerodynamic surface, and an actuator operatively coupled to the surface to control the surface, the controller comprising:
 - a first input accepting a command from the flight control system;
 - a second input accepting a signal representative of a vibration of the structure;
 - a summing element in communication with the inputs and summing the signal and the command; and
 - a first output in communication with the actuator and controlling the actuator with the summed signal and command, the controller coupled to the actuator.
8. An actuator for use on a mobile platform including a flight control system, a structure, an aerodynamic surface, the actuator comprising:
 - a housing; and
 - a circuit coupled to the housing and including,
 - a first input for accepting a command from the flight control system;
 - a second input for accepting a signal representative of a vibration of the structure;

and

a summing element in communication with the inputs to sum the signal and the command, the circuit to control the actuator with the summed signal and command, the actuator adapted to be operatively coupled to the surface to control the surface.

9. The actuator according to Claim 8, further comprising a vibration sensor in communication with the second input to generate the vibration signal.
10. The actuator according to Claim 8, further comprising a position sensor to generate a signal representative of the position of the actuator, a filter in communication with the position sensor and the vibration signal and to filter the vibration signal from the position signal, and an output for communicating the filtered position signal to the flight control system.
11. The actuator according to Claim 8, wherein the circuit is a microprocessor.
12. The actuator according to Claim 8, wherein the circuit is analog.
13. The actuator according to Claim 8, further comprising a power input in communication with the circuit, whereby the actuator powers the circuit.

14. A mobile platform comprising:

a flight control system generating commands;

a structure;

an aerodynamic surface;

an actuator operably coupled to the surface to control the surface,

a vibration sensor coupled to the structure and generating a signal representative of a vibration of the structure; and

a circuit coupled to the actuator and including,

a first input communicating with the flight control system to accept the commands;

a second input communicating with the vibration sensor to accept the vibration signal, and

a summing element communicating with the inputs to sum the signal and the command, the circuit controlling the actuator with the summed signal and command.

15. The mobile platform according to Claim 14, further comprising a position sensor generating a signal representative of the position of the actuator, a filter in communication with the position sensor and the vibration sensor and filtering the vibration signal from the position signal, the filter including an output and communicating the filtered position signal to the flight control system via the output.

16. The mobile platform according to Claim 14, further comprising a first power cable connected to the actuator and supplying power to the actuator, the actuator including a second power cable communicating with the circuit and the first power cable.
17. The mobile platform according to Claim 14, wherein the mobile platform is an aircraft.
18. The mobile platform according to Claim 17, wherein the structure is a portion of a wing.
19. The mobile platform according to Claim 17, wherein the structure is a housing of the actuator.
20. The mobile platform according to Claim 17, wherein the surface is an aileron.
21. The mobile platform according to Claim 20, wherein the actuator is at an outboard location of the aileron.

22. A structure for a mobile platform including a flight control system, the structure comprising:

- an aerodynamic surface,

- an actuator operatively coupled to the surface to move the surface; and

- a vibration sensor to generate a signal representative of a vibration of the structure;

- a cable connected to the sensor;

- a circuit including,

- a first input for accepting a command from the flight control system;

- a second input connected to the cable to accept the vibration signal; and

- a summing element in communication with the inputs to sum the signal and the command, the circuit to control the actuator with the summed signal and command, the sensor, the circuit, and the cable being on the structure.

23. The structure according to Claim 22, wherein at least one of the sensor and the circuit being coupled to the actuator.

24. A method of damping vibrations on a mobile platform including a control system, a movable structure, and an actuator operatively coupled to the structure to move the structure, the method comprising:

coupling a circuit to the actuator;

sensing a vibration of the structure whereby a signal representative of the vibration is created;

receiving a command for the actuator;

superimposing the vibration signal on the command, the superimposing by the circuit;

commanding the actuator with the superimposed signal.

25. The method according to Claim 24, further comprising inverting the vibration signal before the superimposing;

26. The method according to Claim 24, further comprising coupling a vibration signal to the actuator.

27. The method according to Claim 24, further comprising: sensing a position of the actuator, whereby a signal representative of the position is created.

28. The method according to Claim 27, further comprising filtering the vibration signal from the position signal.

29. A circuit for use on an industrial platform including a control system, a movable structure, and an actuator operatively coupled to the structure to move the structure, the circuit comprising:

a first input for accepting a command from the control system;

a second input for accepting a signal representative of a vibration of the structure;

a summing element in communication with the inputs to sum the signal and the command; and

a first output in communication with the actuator to control the actuator with the summed signal and command, the circuit adapted to be coupled to the structure.